

What is claimed is:

1. An image forming device comprising:

a head formed with a plurality of nozzles;

5 a converting unit that converts recording data into driving data, the driving data including data sets defining driving pulses for corresponding ones of the plurality of nozzles;

a feed unit that feeds a recording medium in a first direction;

10 an ejection element provided to each one of the plurality of nozzles for ejecting an ink droplet from the corresponding nozzle onto the recording medium in response to the driving data while the feed unit is feeding the recording medium in the first direction; and

15 a memory that stores nozzle profile data including waveform data and timing data for each of the plurality of nozzles, the waveform data and the timing data indicating a waveform and a generating timing, respectively, of the driving pulse for each one of the plurality of nozzles,
20 wherein

the converting unit converts the recording data into the driving data based on the nozzle profile data, and each of the driving pulses is defined by a plurality of data sets of the driving data.

2. The ink jet recording device according to claim 1,

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A1

further comprising an updating unit that updates the waveform data for each of the plurality of nozzles when a printing condition has been changed.

3. The ink jet recording device according to claim 1,
5 further comprising:

Sub A1
a designating unit that designates a target ink amount of the ink droplet and a target impact position on the recording medium on which the ink droplet impacts;

10 a measuring unit that measures a distance between the target impact position and an actual impact position on the recording medium where the ink droplet has impacted with respect to the first direction; and

15 an updating unit that updates the nozzle profile data based on the target impact position and the distance measured by the measuring unit.

Sub A2
20 4. The ink jet recording device according to claim 3, wherein the updating unit includes a first unit and a second unit, the first unit updating the waveform data of the nozzle profile data so as to change the ejected ink amount of the ink droplet, the second unit updating the timing data of the nozzle profile data so as to control the actual impact position with respect to the first direction.

25 5. The ink jet recording device according to claim 4, wherein each of the driving pulses includes a plurality of sub pulses which are determined by the waveform data,

wherein adjacent two of the plurality of sub pulses are divided by a split time.

5 6. The ink jet recording device according to claim 5, wherein each of the driving pulses has a time width which is determined by the waveform data of the nozzle profile data, and the first unit updates the waveform data so as to change at least one of the time width of each of the driving pulses, the split time of each of the driving pulses, and a pulse duty of the driving pulses.

10 7. The ink jet recording device according to claim 6, further comprising a smoothing unit provided to the driving element, wherein the driving element includes a piezoelectric element and an element driver that controls the piezoelectric element, the element driver outputting a driving signal to the piezoelectric element in response to
15 the driving data, wherein the smoothing unit smoothes the driving signal output from the element driver.

20 8. The ink jet recording device according to claim 1, further comprising a deflection electric field generating unit and a charging electric field generating unit, the deflection electric field generating a deflection electric field in a space defined between the recording medium and the head, the deflection electric field having a field element in a second direction substantially perpendicular to
25 the first direction and a third direction in which the ink

droplet is ejected, the charging electric field generating unit generating a charging electric field in the plurality of nozzles, the charging electric field having a field element in the third direction.

5 9. The ink jet recording device according to claim 8, further comprising a designating unit that designates a target ink amount of the ink droplet and a target impact position on the recording medium on which the ink droplet impacts with respect to both the first direction and the second direction;

10 a first measuring unit that measures a first distance between the target impact position and an actual impact position on the recording medium where the ink droplet has impacted with respect to the first direction;

15 a second measuring unit that measures a second distance between the target impact position and the actual impact position with respect to the second direction;

20 an updating unit that updates the nozzle profile data based on the target impact position, the first distance, and the second distance.

Sub 92
10 10. The ink jet recording device according to claim 9, wherein the updating unit includes:

25 a first unit that changes the waveform data, wherein each of the driving pulses includes a plurality of sub pulses and adjacent two of the sub pulses are separated by a

split time, and wherein the first unit changes the waveform data so as to change one of the split time and a pulse duty of the plurality of the sub pulses, thereby changing the actual ink amount for each of the plurality of nozzles;

5 a second unit that changes the waveform data after the first unit has changed the waveform data, wherein each of the driving pulses has a time width, and the second unit changes the waveform data so as to change the time width, thereby controlling the actual impact position with respect to both the first direction and the second direction; and

10 a third unit that changes the timing data after the second unit has changed the waveform data so as to control the actual impact position with respect to the first direction for each of the plurality of nozzles.

15 11. The ink jet recording device according to claim 10, further comprising a smoothing unit provided to the driving element, wherein the driving element includes a piezoelectric element and an element driver that controls the piezoelectric element, the element driver outputting a driving signal to the piezoelectric element in response to the driving data, wherein the smoothing unit smoothes the driving signal output from the element driver.

20 12. The ink jet recording device according to claim 1, further comprising a leveling unit that levels generating timings of the driving pulses by changing the timing data of

the nozzle profile data.

5 13. The ink jet recording device according to claim 1,
further comprising a resolution changing unit that changes a
time resolution, wherein each one of the plurality of data
sets of the driving data having an original time resolution,
and the resolution setting unit that sets the original time
resolution of each of the data sets to a predetermined time
resolution.

10 14. The ink jet recording device according to claim
13, wherein the original time resolution determines the
waveform of each of the driving pulses, and the
predetermined time resolution determines the generating
timing of each of the driving pulses.